

Article

A phoenix rising? The regeneration of the Ghana garment and textile industry

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Abstract

Some African countries' premier industries, such as textiles, garments and agro-processing, which floundered in the face of market liberalization and stiff competition from cheap imports, are now going through regenerative changes, with some beginning to tell a cautionary tale of a leap upwards. Focusing on the Ghana garment and textile industry, we draw on a framework that integrates social practices and everyday general-purpose technologies to explore the rise, decline and regeneration of the industry. Explicating a fine analysis of how the performative reconfiguration of social practices and functional sources of innovation and technologies may combine to support innovation-driven growth, our study sheds light on how loosely connected actors within a hitherto floundering industry can learn to transform their situated practices to drive their 'industrial regeneration'. Implications for the theory and practice of industrial regeneration are outlined.

Key words: China-made technologies, Ghana, garment and textiles industry, social practice, industrial regeneration

JEL classification: L67, O33, O14

1. Introduction

Extending our understanding of the historical, economic and environmental context within which industries may survive or collapse (Francis, 1992; Damodaran and Singh, 2007; Amankwah-Amoah, 2015), studies have repeatedly pointed to the potentialities and limits of innovation and technology in the revival of moribund and floundering industries (Cabras

and Bamforth, 2016; Yli-Viitala *et al.*, 2020). What we are not clear about is how the aggregate behaviour and strategic leverage of innovation and technology by loosely connected industry actors may facilitate the process of industrial revival in practice. In response to this, our study takes a step forward by extending our understanding of how functional sources of innovation and technologies emerge through knowledge reconfiguration to drive industrial regeneration. By studying the rise, fall and revival of a premier industry, we build theory on the processes of industrial regeneration in the context of relatively underdeveloped institutions and markets.

We develop our contribution based on Ghana's garment and textile (G&T) industry: an industry that embodies the deep and complex nature of African cultural identity and serves as a microcosm for post-independent African industries nurtured behind trade barriers. At its peak, the textile subsector alone had about 16 major manufacturers and 138 medium- and large-scale registered garment manufacturers, and employed over 25 000 people. Trade-liberalization policies and the opening of the economy in the 1980s and 1990s decimated the industry. They heralded both the mass import of cheap second-hand clothing from Europe and the Americas and the import of cheap new goods, especially from Asian countries such as India. In the early 2000s, stiff competition from cheap imports and fake textiles from China further damaged local creativity and profits. Even the African Growth and Opportunity Act (AGOA), signed between African countries and the USA in the 2000s, could not help to prop up the industry, because the Chinese opportunistically exploited this Act, circumventing tariffs by using Ghana as a stop-off for exports to the USA. Yet by the 2010s, the industry had undergone unprecedented transformation in response to government industrial policies and industry actors' responses to the fundamental forces shaping their once-protected industry. The floundering industry had begun to make great leaps upward once more. The garment and apparel sub-sector alone now employs more than 6000 people and exports goods worth about \$30 million annually. The language of failure frequently used by commentators to describe the industry has now largely fallen into disuse.

To build theory on 'industrial regeneration', we gathered data using semi-structured interviews with industry actors and from industry reports and press articles. In unpacking the enigma of this industrial regeneration, we identified various sources of technologies and innovations and the corresponding practices and activities which played a central role in giving life to a once-decimated industry, which has been persistently written off by industrial commentators. Utilizing the prism of social practices, as promoted in recent contemporary social theory, our process model describes the performative practices of industrial actors in the regeneration process by emphasizing how new sources of knowledge and innovation produce (un)planned labour reallocations and efficiency improvements for industrial regeneration.

Our study makes three salient contributions. First, providing insights into the circumstances triggering the rise and fall of an industry that is so significant in the context of the economic development of low- and even middle-income countries in general, we identify four functional sources of innovation (second-hand clothing, China-made technologies, social media and fashion salons and pan-African arts and artefacts) which revived the industry and theorize how they constitutively operate in combination or serially to support the innovations driving the gradual regeneration of an industry that has undergone a long period of decline. Our analysis suggests that the regeneration of the industry as driven by innovation-to-value processes plays out in the form of best of benchmarking, competitor

design teardown and cultural modernity. Second, we develop a process model to show how innovation happens and jumpstarts an industry which has been on its knees. Industrial regeneration, we propose, involves the adoption by industrial actors of new performative practices which provide scope for orchestrating a strategic shift from one value-added activity (e.g. production), to specialize or coalesce around another value-added activity (e.g. design and marketing), in order to create and capture sustainable value. Our third contribution seeks to highlight and advance research into technologies and innovations emerging from unexpected places. We argue that such overlooked technologies and innovations have the potential to (re)configure industrial structures and transform floundering industries in ways otherwise overlooked by traditional industrial innovation models. Emphasis on this aspect of industrial renewal can yield insights into new possibilities for improving lives and reducing inequalities in former industrial heartlands.

2. Literature review

2.1 Sources of technologies and innovation in the global G&T industry

For centuries, the global G&T industry has been driven by new technologies and innovations (Shishoo, 2012; Goedhuys *et al.*, 2014). Traditionally, scholars have drawn a distinction between two specific sources of technologies and innovations underlying the extraordinary growth of global output and a steep reduction in the cost of producing textiles and garments (Bell and Pavitt, 1995). The first concerns dye-, finish- and fibre-related innovations (Paul, 2015; Kane *et al.*, 2020) and has given birth to a vast array of synthetic fibres and functional or technical textiles in response to a globally demanding consumer market (Holme, 2007; McCarthy, 2016). Inspired by emerging technologies such as nanotechnology and biological approaches, including biomimetics (Köhler and Som, 2014; Chae and Hinestroza, 2020), the upshot of high added value textiles is a new generation of intelligent and smart textiles and clothing which are able to sense and adapt to environmental stimuli such as light, temperature and humidity (Tao, 2001; Wang *et al.*, 2020). Despite inevitable overlaps, the second source, in parallel with the first, focuses on innovation in G&T production technologies. Studies in this domain tend to prioritize advances in manufacturing technologies (Elmogahzy, 2019), technological upgrading of the industry (Kadarusman and Nadvi, 2013) and innovation efforts in their global value chains for managing capital and labour flows (Gibbon, 2008; Azmeh and Nadvi, 2014). For centuries, the northern economies (Europe and North America) have been the main origin of both fibre innovations and new production technologies for the global garment manufacturing industry. The rise of China (and to a lesser extent, India) as significant players in the global economy has changed this equilibrium (Kaplinsky, 2013). In the past decade, China has become an important alternative source of both innovative fibres and production technologies, such as ginning machines and sewing machines. Chinese-produced technologies reign in many parts of the developing world (Botchie *et al.*, 2018) because they offer a range of technological choices, particularly for the small-scale and dispersed production of G&T. Scholarship in this domain suggests that northern-produced technologies are of higher quality and much more durable, but are also more expensive (Botchie *et al.*, 2017). The Chinese-produced technologies, even though inferior in quality, are gradually emerging as the technologies of choice in many developing countries (Baum, 2019). This is because they are much better at enhancing the capabilities of

poor garment producers, particularly women and rural dwellers (Kaplinsky, 2013; Botchie *et al.*, 2018).

Beyond the technologies, extant theory has repeatedly emphasized creativity in the form of strategizing, new organizing forms, production processes and innovation activities as fertile ground for innovation opportunities (Muñoz *et al.*, 2020). From this perspective, the strategic configuration networks orchestrated by firms embedded in the industry are major sources of information and ideas for innovation (McAdam and McClelland, 2002). Frequently involving external research and development collaborations and vertical co-operation ties with pivotal industrial and commercial partners (Tomlinson, 2010; Zucchella and Siano, 2014), the success of these innovation networks involves knowing where the value resides and developing the requisite capabilities to access, explore and exploit it in ways otherwise overlooked by competitors (Perks and Jeffery, 2006). Recently, a growing body of research has documented the new adoption of circular approaches to reinventing the global G&T industry (Urbinati *et al.*, 2017; Goldsworthy *et al.*, 2018). Fuelled by emerging technologies such as industrial revolution (Zille *et al.*, 2015) and innovative practices such as co-creation and digital fashion (Jain *et al.*, 2021), the new approaches promise to revolutionize the way garments are produced, retailed and consumed (Hauser *et al.*, 2019; Wood *et al.*, 2020). Thus, this stream of studies predominantly focuses on exploring and exploiting disruptive technologies, sustainable processes or new business models which could improve the way textiles and garments are designed, produced, shipped, bought, used and recycled (Ekström and Salomonson, 2014; Bide, 2020). Cumulatively, the underlying message of this new paradigm has been rather similar: a transition to sustainable consumption that prioritizes restorative and regenerative innovation (Payne, 2019).

Despite the progress, stiff global competition and deep-seated structural and geographic differences in many countries in the global South have made it difficult for many once-productive firms to compete (Akinrinade and Ogen, 2008). In this regard, the global G&T industry appears to be heading toward vertical disintegration, with a few flexible production regions remaining (Crewe, 1996; Loo, 2002). Thus, the graveyard of industrial failure is full of G&T firms, particularly in the global South. Scholarly explanation of this paradox, representing an interesting mix of competing ideas, points to three constitutive challenges facing firms embedded in the developing world. The first is that they face a severe threat of technological obsolescence because of underinvestment or their inability to procure and adopt new technologies which could improve their productivity output and overall competitiveness (Amankwah-Amoah, 2015). The second is related to how firms learn to successfully manage their technology transfers, which is determined by the wider social, historical and economic context within which the transferred technology is produced (Morita and Nguyen, 2021). Relatedly, Botchie *et al.* (2018) found that the transfer mechanism and appropriateness of G&T technologies, including capital equipment, intermediate goods and organizing processes, play a significant role in the successful transfer of these technologies to many developing countries. The third challenge is the potential to circumvent trade barriers, which tend to impede the diffusion of potentially useful innovation and technologies (Moodley, 2003). For example, Gruber's (1998) study of the diffusion of the shuttle-less loom, a major innovation in the textile industry, found trade liberalization to have the most potent impact in accelerating diffusion of innovation in protected industries like textiles.

In summary, prior research on the G&T industry has highlighted some relevant sources of innovations and technologies and how they are delivering value along key dimensions of

value creation and capture on a global level. However, given the epistemic gaps between what people *say* they do and what they *actually* do in practice, greater consideration of context is required to understand how these technologies and innovations help to transform organizing processes and activities to deliver high added value products for consumers. In the next section, we delineate our discursive practice approach to innovation, in order to extend our understanding of the patterns of transformation in the global G&T industry.

2.2 A discursive practice approach to innovation in the G&T industry

The idea that our social world is a construction of meaning has led to the recent focus on ‘practices’ in accounting for social life (Schatzki, 2001a; Reckwitz, 2002). A practice, as defined by Pickering (1997, p. 328), is ‘the real time work of cultural transformation’. Ongoing cultural transformation implies that practices, just like esoteric technical fields, are characterized by collective agreements and are in constant flux and transformation. In this regard, our practice approach follows Shove *et al.*’s (2007) unified analytical practice framework, theorizing that practices have spatial, dynamic and temporal features, and that they represent the outcome of a complex web of performative linkages between tools/materials, meanings and the effects of performance by actors. Taking the three crucial components in order, ‘*Materials*’ refers to transitive objects such as resources, technologies, infrastructure and, in our case, intransitive objects, such as copyright, design and regulations. ‘*Meanings*’ refers to ‘the social and symbolic significance of participation consisting of aspirations, emotions, ideas and motivations that allow meanings to materialize to inform and constrain identity and action’ (Sarpong *et al.*, 2020, p. 53). ‘*Competence*’ refers to what Shove *et al.* (2007, p. 23) describe as the ‘multiple forms of understanding and knowledgeability’—that is, know-how and insight—required to excel in the performance of the practice.

The core of our conceptualization of innovation in the G&T industry as a social practice concerns enacted practical activities and their representations. We seek to uncover how everyday human doings could contribute to our understanding of the mechanism through which innovation comes to life. Thus, we argue that the everyday situated activities driving innovation in the G&T industry are in constant flux and transformation. Therefore, these constellations of activities constitutively help with the understanding of the logics of innovation and how it shapes an industry. The activities include changes of technical skills, actors’ shared skills and understanding and the establishment of what MacIntyre (1985, p.185) calls ‘internal goods’: ‘goods that cannot be achieved in any other way but by participating in the practice itself’. Here, the practices of actors serve as the prime context of social orders, with people moulding their actions and their associated meanings (Schatzki, 2001b). Innovation as a complex form of social practice (van der Have and Rubalcaba, 2016) requires actors to have access to the industry’s assets, which may include garments, technologies, symbols and machinery, in order to accomplish their tasks. The sustenance and the advancement of the shared practice-innovation require continuous interaction between actors in organizing (MacIntyre, 1985). As the assets mediate these interactions, the actors interact with the assets collectively as well as in their individual situated contexts. Within these ongoing interactions, perceptions and actions are focused on information in the environments, and actors use such information to solve their problems, to reflect on their practice, and to share ‘good practice’. In this sense, actors collectively embark on creative efforts when there is scope for improvement on their practice. We follow Orlikowski (2000) in

arguing that the intersection of routine practices acts as a conduit for the transformation of institutionalized roles, patterns and structures mediated by technology.

Our discursive practice approach therefore draws on the tradition of language as an interpretive repertoire of evolving micro-practices (Kibble, 2020), or a 'nexus of doings and sayings' (Schatzki, 1996, pp. 89–90) that constitutes the everyday organizing in the broader G&T industry. In this regard, we conceptualize innovation in the G&T industry as neither a process nor an attribute of industry actors. Rather, it is something that actors do in their everyday situated practice (Feldman *et al.*, 2016). In the following section, we present an overview of the Ghanaian G&T industry, charting the ideological and historical context necessary for interpreting the rise, steep decline and resurgence of the industry.

2.3 Research settings

The rise, fall and revival of Ghana's G&T industry are instructive. The 1960–1970s represent the golden age of G&T production in Ghana. The country's modern textile industry started in 1960 (Mensah, 1998). It focused on the production of fabrics for use by the garment industry and the export market, and dominated Ghana's manufacturing sector (Quartey, 2006). The G&T industry during this period was driven by local innovations and access to cheap technologies that sustained a small but thriving artisanal garments sector and paved the way for small- and medium-scale enterprises to play a major role in the industry (Amankwah-Amoah, 2015). The climax of this golden age came in the 1970s when the textile subsector had 16 major textile manufacturers and employed over 25 000 people.

We identified three historical traumatic shocks that changed the contours of Ghana's G&T industry, and whose impacts persist, shaping the strategy and profitability of firms to this day. The first was the general economic collapse that Ghana suffered before recovery began following the May 1983 budget (Herbst, 1993), which led to massive shortages of basic consumer goods, including textiles and garments: the latter almost completely vanished from overt sale, though a limited supply was accessible via the (illegal) parallel market. Manufacturing around this time declined as a share of the rapidly falling Gross Domestic Product (GDP), partly because of shortages of everything imported, and because of shortages of domestic foodstuffs because producers and traders were reluctant to sell at the official prices (Rimmer, 1992). This was followed by the IMF-World Bank supervised Structural Reforms programme from 1983 to the 1990s, which further removed the G&T industry's protective barriers against foreign competition (Brooks, 2019). The country is estimated to have lost four-fifths of its textile and clothing jobs during this time (Frazer, 2008).

The second was the upending of commercial ties between Ghana and China in the 2000s. Nevertheless, we assert that the misfortunes of the sector were not limited to ruthless competition from Chinese imports. Second-hand clothes imports, technology obsolescence and incoherent government support for the industry in general (Amankwah-Amoah, 2015) made it difficult for local firms to produce cheaply enough for local consumers with very weak buying power (Economist, 2018). We present a brief sketch of the industry's evolution over time.

The third traumatic shock occurred in the early 2000s and was characterized by surging Chinese imports and the unintended consequences of the AGOA, a duty-free deal that was expected to improve Ghana's access to the US market and boost its export potential in contrast to most of America's clothing imports from places such as China, which have a 20% import duty. However, the textile industry's benefits were short-lived because Chinese textile

exporters managed to circumvent trade barriers with the USA by trans-shipping their products to the USA through Ghana, without necessarily citing any value-added textile activity in Ghana (Zeidan, 2015). In this way, AGOA became nectar for the Chinese businesses and turned out to be poison for African garment manufacturers. In addition, the Chinese businesses out-muscled local textile-producing companies by flooding the Ghanaian marketplace with cheap and sometimes fake imported textiles. They went even further, pirating local textile-producing firms’ registered designs embodying the deep and complex nature of African cultural identity (Darku and Lubisi, 2020). Reminding us of the adage ‘the ship that brought the Bible to Africa also brought the gunpowder’, Chinese businesses also became an alternative source of cheaper complementary technologies such as sewing machines and leather machinery, offering technological choices for large-scale, small-scale and dispersed production of cheap clothing made from African-designed textiles (Botchie *et al.*, 2017).

The year 2010 represents a watershed moment for the floundering Ghanaian G&T industry. At that point in time, there were only four players left, operating at different levels of activity and employing approximately 2900 Ghanaians: a 90% decline in the industry’s contribution to employment over a period of 50 years. By 2011, the ratio of imported textiles to exported textiles in Ghana was 125%, and this shot up to a staggering 827% by 2015 (Ghanaweb, 2017). Nevertheless, around the same time, the industry appeared to be putting the genie back in the bottle. The industry in 2016 employed more than 6000 Ghanaians and exported about \$30 million annually (Ghanaweb, 2017). In this regard, while Ghana’s G&T industry exports have indeed recovered from the collapse of the 1970s, the turnaround in relative terms remains a tiny part of Ghana’s exports, which in 2020 were some US\$20 billion.

As shown in Figure 1, the value of G&T output in Ghana has grown steadily, from virtually nothing in 2000 to US\$2 billion for garments and US\$1 billion for textiles. This is indeed rapid growth, but two qualifications are necessary. The first is that no allowance has been made for price changes in the data. Second, Ghana’s manufacturing output for 2020 was \$7.18 billion, while Ghana’s GDP was estimated at some US\$72 billion. From the

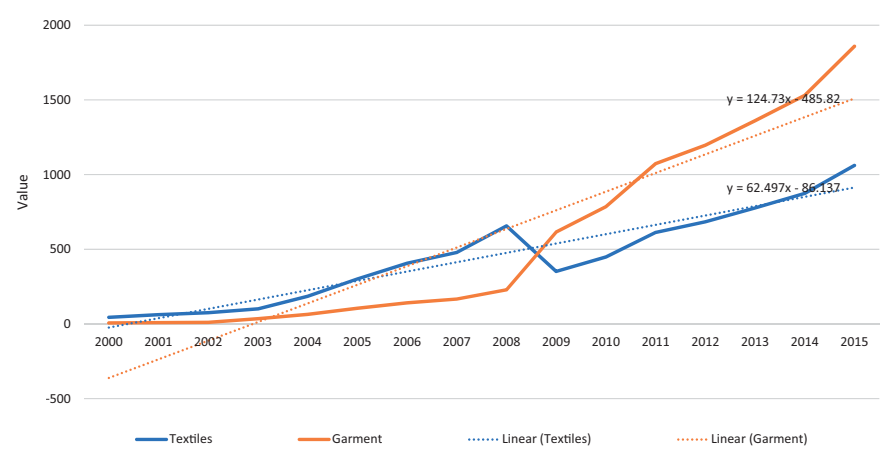


Figure 1. Value of G&Ts output in Ghana (Million US\$).

Source: INDSTAT - 2 2020, ISIC Revision 3, UNIDO

viewpoint of the whole economy, manufacturing is a minor part, and indeed, has not changed as a percentage of GDP from the 1960s.

Interestingly, the majority of the people currently employed in the industry, rather than working in the direct production of textiles and garments, are fashion entrepreneurs, designers, marketeers and haberdashers. These loosely connected actors are focused on niche African print product innovation, embedded in small-scale supply chains and what [Doeringer and Crean \(2006, p. 353\)](#) refer to as ‘flexible retailing’ and ‘collaboration economies’ in design and production networks. This comes at a time when West Africa is becoming the beating heart of African culture and fashion ([Aziz *et al.*, 2019](#); [Craik, 2020](#)). In stark contrast to the desire to create and protect jobs and the imperative to allow the market to resolve the competitive problems characterizing the industry, around this time Government policies and legislations to resuscitate the industry appear as ‘constructive ambiguity’—disguising government commitment to support the industry. The government, posing as a bulwark against the menace of industry decline, has gone so far as to roll out and support social mitigation strategies which strengthen confidence in the resurgence of the industry. For example, it continues to promote the ‘National Friday Wear’ policy, which encourages state employees, government officials and office workers to wear Ghanaian-made garments to work on Fridays. The average Ghanaian not only frequently wears what has become known as the African print, but also is now very much aware of brands such as Woodin, Vlisco and GTP, which are associated with these bold, bright and colourful African fabrics. Clearly, the Ghanaian garment industry, which had struggled over the years, seems to be in regeneration. In response, the question driving our inquiry is: What are the sources of innovations and technologies driving the regeneration of the Ghanaian G&T industry? In the next section, we present our research method.

3. Methods

Our starting point was a publicly available online business directory ([Business Ghana, 2020](#)) that lists over 500 independent and loosely connected ‘actors of practice’ in the Ghanaian G&T industry. Ranging from fashion entrepreneurs to haberdashers, these agents carry out (non-) market interactions for the creation, production and sale of textile commodities and garment products ([Weller, 2008](#)). We contacted those companies and individuals (140) whose telephone numbers or social media pages (Facebook) were listed in the directory and invited them to participate in the study, arranging interviews where possible. Our data collection took place from the second quarter of 2019 to the second quarter of 2020. Our data-gathering included 52 interviewees of different types, namely garment designers ($n = 12$), artisanal ‘master’ tailors and seamstresses ($n = 20$), fashion entrepreneurs ($n = 10$), apparel manufacturers ($n = 2$) and haberdashers ($n = 8$). In addition, we also interviewed the Chief Executive of the Ghana Free Zone Board in order to gain some relevant insight into recent government policy initiatives and efforts at supporting the industry. One of the apparel manufacturers we interviewed also doubled as the President of the Association of Ghana Apparel Manufacturers.

Employing a grounded theory approach to our data collection and analysis (Straus and Corbin, 1994), we began each interview with assurances of confidentiality and the collection of participants’ socio-demographic data. Participants were then invited to tell us about their subjective work experiences in the industry. Using ‘detailed language specific to a trade of

function' (Raelin, 2007, p. 498), we probed for explanations as to how they organized their work and how they came to make choices in purchasing the consumables, technologies and equipment they used for their work. We relied on discursive devices and practices such as referencing and relating (Wenzel and Koch, 2018) to encourage our participants to speak the 'language of interest'. The interviews lasted between 30 minutes and 2 hours, and all were digitally recorded and transcribed. Our participants were aged between 22 and 73 years old, with approximately one-third (52%) being female. Together, they reported an average of 11.8 years working in the G&T industry. In our efforts to locate our studies within the communication and interaction channels of the industry actors, we supplemented our interview data with documentary materials on the Ghanaian G&T industry. These included trade articles, business magazines, industry periodicals/press releases and newspaper articles. Using the online COMTRADE database, we also perused and reviewed historical and emerging patterns of general G&T-related imports and exports, which helped us to consider *inter alia* the trends in the imports of machinery, accessories and overarching policy strategy of the government.

3.1 Data analysis

Our data analysis followed three main steps. First, we listened carefully to the audiotapes several times to ensure that they reflected what we had heard in the field, in order to make meaningful judgements of contextual statements, their relevance and implicit connections (Marshall and Rossman, 2014). Here, cross-references were made between the transcribed data and mental and field notes, which allowed for adjustments where necessary. Our initial textual analysis of the interviews and archival documents focused on the everyday work of each of our loosely coupled constellations of actors, *which* technologies they employed for their work, *how* they organized their work, and their acquired situated practical skills, perceptions and future images of the industry: these served as our basic social processes (BSPs) (Glaser, 1996). We produced a plethora of initial codes (Saldaña, 2013) to capture our respondents' perspectives on the industry's key events and its outlook, the salient technologies that the respondents used for work, and the broader impact of government policies on the industry. These were further categorized according to their similarities and analytical connections, and recurrent phrases were also identified and 'analytically converted' (Strauss and Corbin, 1994) to fit our BSP categories.

In the second stage, we iteratively cycled between the data and extant innovation and industry regeneration literature, looking for patterns of systematic references to sources of technologies and innovation in the global G&T industry as a guide to identifying a broad range of relevant themes. The identified themes were then analysed and interpreted iteratively until a few common themes emerged and became saturated (Suddaby, 2006). We then sorted, reconstituted and indexed the themes to generate the analytical categories (Myers, 2019) of: second-hand clothing, new print and social media, pan-African arts and artefacts, China-made technologies and garment and fashion salons.

Probing further the connections and conceptual properties of the respective categories, we developed four aggregate theoretical themes, which we used to explore viable theoretical explanations of what we heard in the field, namely: reverse design and the reinvention of local forms, appropriate technologies, creative forecasting and social technologies on the web and transubstantiation-of-value. Finally, we applied the indexed categories to the entire dataset. We then continued with our systematic comparison of the themes to reconnect

extant literature with our chosen theoretical lens and to produce generalities and build understanding of how the plethora of loosely coupled actors make sense of their industry's transformation in narrative terms.

3.2 Research findings: innovation by stealth, ingenuity and resourcefulness

Constantly exposed to external stressors, risk and volatility over more than four decades, evidence from our study suggests that Ghana's G&T industry has changed over time. We follow Taleb (2012) to describe it as *antifragile*: something that gains from disorder, shocks or stress, as it shows characteristics which go beyond resilience and robustness by getting better. The antifragility of the industry has led to a self-driven 'smart specialisation' (Paliokaitė *et al.*, 2016) process, which takes the form of strategic forbearance involving the shift from production to innovation in value-added design activities, rather than a direct attack on the competitive forces responsible for the decline of the G&T industry. We observe that the practice in the industry is idiosyncratic, non-linear, and involves 'spatio-temporal configurations of fashion knowledge' (Weller, 2007, p. 39) within a cultural production system. We argue that the coming into presence relies on the ability of the loosely connected actors in the industry to generate new absorptive capacities and the transmission of fashion ideas (Okafor *et al.*, 2017). Thus, one or more actors in the industry recognize a new set of design-to-value process possibilities and begin to explore it. In general, actors soon coalesce and begin to exchange innovation-related information. DVI in practice serves the context within which new sources of innovation and the activities supporting them come to life.

3.2.1 Reverse design and the reinvention of local forms

Our data evidence suggests that there has been an exponential growth in the volume of imported second-hand clothing and textiles fibres over the years (see Figure 2). The salient aspects of this import trend for the G&T industry are the new unregulated import regime and some of the pervasive large-scale social changes that have occurred over time (Sechandice, 2009). Such social changes include the relative value of Western versus

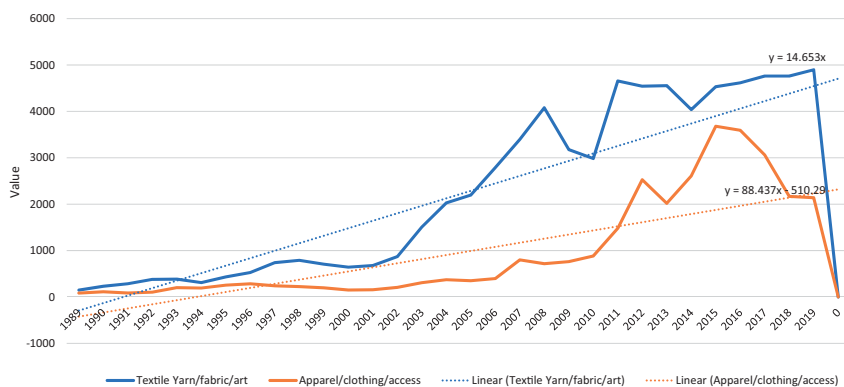


Figure 2. Global textiles and worn clothing imports to Ghana, 1988–2020 (Millions US\$).

Source: WITS—Comtrade Database: Textile Data as SITC Revision 3, 65 Accessed 12/05/2021

Worn Clothes as SITC Revision 3, 84 Accessed 12/05/2021

indigenous textiles, the shifting concept of the types of costumes and garments worn by elites and ‘educated’ people, and how wearing imported Western-styled clothing affects work and social identity (Hansen and Madison, 2013).

Conversely, these changes also inspired the making of some ‘Western clothes’ using African textiles and the birth of a new cultural economy which thrives on appropriating and imitating the styles, design and appearance of the second-hand clothes. We found that imported, cheap, cast-off clothing, which for decades damaged the indigenous G&T industry, over time turned out to be a catalyst for the industry’s revival. This emerging form of reverse innovation (Agarwal *et al.*, 2020) which we label ‘reverse design’, relies on the agency of industry actors and often integrates technology with design and incorporates pre-existing clothing and textile production practices. As Clement, a fashion designer, reflected:

Africa is still growing in getting craft right with fashion designing. We learn a lot from their design and mostly copy pattern layouts. All the vintage inspirations used in the African clothing designs you see in the high street shops come from the second-hand clothes.

The majority of our respondents conceded that Africa is still growing in the global context of fashion design, and as such, it is not out of place if designers still draw inspiration from imported second-hand clothing. They considered imitation as sincere flattery for Western fashion, which they make function in another register. We found that such dispositions and sensibilities motivated people to study in detail the patterns and style of second-hand clothing and to attempt to duplicate their features, even in the simplest of ways. As a seamstress admitted:

Getting ideas for new clothing styles can be as simple as separating all the parts to find out where the seams are joined. You can then see exactly how these Next and M&S clothes were made.

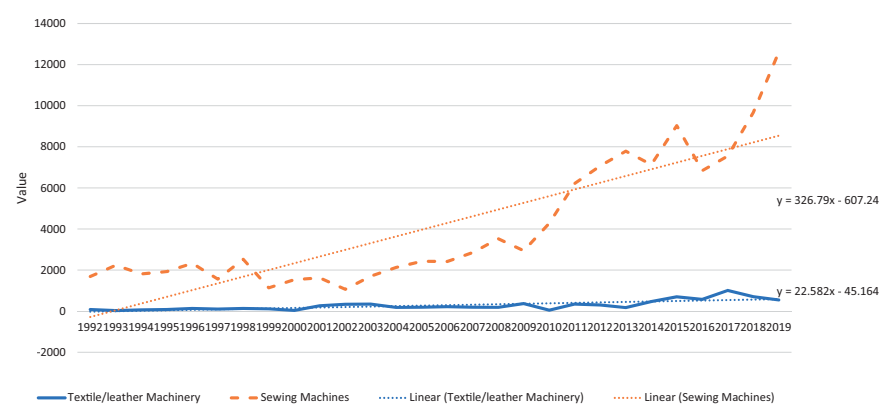


Figure 3. China-made G&Ts machinery imports to Ghana, 1992–2018 (Thousand US\$).

Source: WITS—Comtrade Database: Textile/leather Machinery as SITC Revision 3, 7244 Accessed 12/05/2021

Worn Clothes as SITC Revision 3, 7243 Accessed 12/05/2021

In a related comment, a designer had this to say:

I know that the reason why people are into African clothing is the comfort it gives as compared to imported second-hand clothing, but you know, the best styles come from the West, so they are my number one source of inspiration. I frequently go to the second-hand clothing retail place, just to trawl the clothes for styles and designs, which I integrate into the products I make here. They give you a bird's-eye view of trends in shoppers' preferences.

Beyond the cultural politics, this designer went on to suggest that the meaning of second-hand clothing, together with the local appropriation and reinvention of its afro-centric forms, not only sparks people's imagination but is also transient and keeps shifting across classes and the Ghanaian society. Opening spaces for local agency in garment production and consumption, second-hand clothing does not preclude innovation but paradoxically promotes it, by anchoring consumers' quest for emerging trends and styling in a cultural economy, even when trends and styling are in perpetual flux and transformation.

3.2.2 Appropriate technologies

'Appropriate technologies', as used in organizing our findings, refer to China-made technologies, including sewing or knitting machines and 'notions' (small items used in sewing, such as buttons, zips and pins). Their innovation-enabling mechanism and influence on the industry echoes how second-hand clothing, which began to destroy the industry, turned out to be a source of innovation, leading to the industry's reincarnation. Thus, the China-made technologies that came with the cheap and fake garments which caused the systematic decline of the G&T industry in the first place also reversed this decline.

As shown in [Figure 3](#), our data evidence suggests that the steep rise in available, China-made technologies has created a new breed of enterprising retailers: haberdashers, who earn a modest living retailing these technologies in key locations. In this regard, any skilled tailor or seamstress, even with limited resources, could start up a business producing and selling tailor-made African costumes and cheap bespoke outfits. Therefore, we surmise that the China-made technologies, finessed by haberdasher businesses popping up in the Accra central business district and suburban centres, are at the heart of the boom in small tailoring shops across the country ([Hirsch, 2013](#)). One entrepreneur said:

Some of the fabrics we use are made in Ghana. We buy everything else, from sewing accessories to thread and needles, from Accra central business district. They all come from China. Yes, my sewing machines are from China. The quality is as good as the ones from UK and USA.

Apparently, the use of sewing machines made in the UK and the USA by small-scale garment producers became commonplace during the colonial and early independence periods and has continued to the present. Nevertheless, cheap Chinese-made sewing machines predominate nowadays, displacing US- and UK-made sewing machines, which for decades were the mainstay of the global garment manufacturing industry ([Botchie *et al.*, 2017](#)). We observe that this trend has brought greater scrutiny to the quality, technological inclusiveness and range of technological choices for small-scale garment manufacturers ([Botchie *et al.*, 2018](#)). One seamstress, in expressing the consumer perspective within the unfolding story, underlined the primacy of China-made technologies in supporting enterprise and human capability development in the global South:

Oh, not all Chinese products are bad. Some are very, very, good. They have ensured that different segments of the industry have access to quality machines and accessories at affordable prices. Many people cannot afford those imported from England, USA, or Germany. If there were locally produced alternatives to compete with the Chinese imported machines and accessories, more jobs would be created, and prices would be even more competitive.

While questions still linger about the quality and productivity of the China-made technologies, many of our respondents refused to accept the view that Chinese products are of inferior quality compared to those from Western countries. Referencing the role of China-made technologies in a new 'golden era' of entrepreneurship in their industry, our respondents gave credence to Hirsch's (2013, p. 2) observation of the city of Accra, which she describes as littered with 'unassuming men and women who sit in shipping containers-cum-workshops on just about every road in every town, bent over sewing machines, making clothes that fit perfectly'.

3.2.3 Creative forecasting and social technologies of the web

The core of the industry's regeneration, we found, is the self-perpetuating creative practice of industrial actors and the social technologies of the web, which facilitate the formation of some enduring and transient practice networks and drive knowledge flows through the industry. Here we found two central practices underlying the industry's ability to walk the innovation tightrope. The first relates to fashion competitions, meetings and salons, which have come to serve as industry-configuring events and quintessential experimental spaces where actors discuss, contest and negotiate the meanings of garment and design innovations. These *haute couture* events are endowed with material resources, meaning and values and take place at conference centres and hotel pool-sides, where industrial actors ranging from designers, entrepreneurs, models and retailers converge to display products, designs and yet-to-be-realized visions of the future. A designer who described himself as an African garment aficionado succinctly expressed this:

I have presented my collection on the catwalk at some of the global hotels in Ghana. It's a platform to really showcase your work to the fashion community, the local press, and potential customers.

Three of our designers mentioned that they had attended fashion shows in Nigeria, Senegal, South Africa and even the famous Vienna Fashion Week. We found that the various actors who take part in these salon shows not only have heterogeneous motivations and capabilities, but also perform distinct activities and play different roles, which are critical to the success of their innovation efforts. For participants, such elite fashion events serve as a fundamental context where the development and commercialization of industry innovations mutually reinforce and solidify. The generation of unexpected innovations from creative forecasting, however, has involved not only fashion shows and catwalk contests, but also social technologies on the web. Social media such as Instagram, YouTube and fashion blogs have enabled the sharing of knowledge and interaction among local industry actors, their customers and global networks. As one seamstress observed:

WhatsApp, Facebook, and Instagram have done very well. Because of them, we can now advertise our products locally and internationally. Even 'white people' are buying our products and

using them in their homeland. We must applaud the inventors of these apps for a job well done (Mavis).

These social technologies are driving the ongoing digital transformation of the ‘traditional’ industry organizing practices which have historically shaped the industry. They are changing the ways in which the industry’s focal actors interact with customers, employees and other stakeholders. In particular, digitalization is redefining the provider–client dynamics of the industry: many people have stopped visiting their tailors for measurements and textile selection. Instead, customers routinely take a picture of an outfit somewhere using their smartphones. They go on to search and choose their preferred textile and simply send order details via WhatsApp to their seamstress or tailor. This transition *en masse* to technologies of the web is fast changing skills and making redundant some of the fundamental practices passed on from one generation of tailors and seamstresses to another over the decades. For one tailor:

People these days mostly come to me with their design in mind. Some of my regular customers will send me their style via WhatsApp on my smartphone. They will send me their design and they will ask me if I can design the exact type or if I can modify it into something nice. When I can do, I give them the feedback, and they will come and see me with their African fabrics.

Here, physical garment style samples and in-person selection of styles have now been replaced by online selection from world-class styles, freeing up tailors and seamstresses to focus on what they value most: helping clients to choose fabrics. The advent of iPlayer means that some enterprising designers and tailors, in their search for new designs and ideas, are keen followers of global entertainment that focuses on beauty and style. At least four of our respondents said they regularly watched the BBC Great British Sewing Bee programme on their handheld mobile devices such as smartphones and iPads. Hosted by experienced commentators on global fashion, clothing and textile industries, our respondents said these programmes gave them fresh insights into Western ethnic fashion and how they can potentially make modern copies of vintage patterns. While our data evidence suggest that these social technologies are imperfect proxies for gauging the diffusion of recent technologies into nearly every aspect of social life in our empirical research setting, their unprecedented reach across the fashion industry in Ghana has led to a democratization of and unparalleled access to vintage and new designs, and sometimes markets, around the world, revolutionizing how industry actors create and capture value.

3.2.4 Transubstantiation-of-value

Our data evidence suggests that an emerging interpretive process of making sense of events and experiences of the modern post-colonial society, as played out in Ghana, is supporting the regeneration of the G&T industry. We employ the concept of transubstantiation (Kreiner *et al.*, 2015) as an organizing device to explicate how people bring African garments as an institutional substance into being, as they attempt to justify their essence, value, and place within society, and in the world at large (Baytar *et al.*, 2021). We follow Rovine (2015) to argue that this interpretive frame is in no way shaping the virtues, expectations and consumption standards of African garments in society. Thus, highlighting a process of giving substance to something while its essence remains the same (Kreiner *et al.*, 2015), we

use ‘transubstantiation-of-value’ to mean the perceived creation and capture of value from African garments to the same remarkable degree as Western clothes. A real or imaginary ‘leveller’, it provides a context for consumers of and advocates for African garments to claim to capture the same or even better value from African garments than from Western clothing (Essel and Amissah, 2015).

I know that the reason why people are into African clothing is the comfort it gives as compared to second-hand clothing such as suits, hoodies, and jackets. Personally, I will choose African wear over ‘already-made’ clothes, anytime and anywhere.

The expressive power of transubstantiation-of-value, we found, also arises from the use of the routine process of meaning-making and consumption of cultural products that is common in all societies and cultures—blends of cultural ideas and sensory imagination to inspire people who buy and wear African garments. A cultural reproduction of the new interest in African heritage and empowerment, these meaning-makings represent a seismic shift to re(embracing) African *consciencism* whereby critical material consciousness and humanism emerge from modern African responses to conquest, colonization and social problems (Boadi, 2000; Allman, 2004). These, we found, often take the form of ideological slogans and advertising narratives such as: ‘Western clothes are at fault, not our bodies; Tropical heat makes Western imports impractical!’ Such meaning-makings are not simply driven by identity. They are also generated around real social issues and serve to boost morale and mobilize differential visions of yet-to-be-realized futures. A major retailer of African garments, captures this vividly in their advertising:

.... African brand offering a contemporary and wholly African fashion range for style savvy individuals. Our limited-edition fabrics, ready-to-wear outfits and fashionable accessories are constantly evolving to define a new African fashion identity.

At the industry level, we observed that such meaning-making frames drive the emergence of what we refer to as Afro-textile value taxonomies: the re-categorization of the perceived value of African textile as a product ‘made in Africa, by the African, and for Africans’. Within the context of promoting African cultural renaissance, the new classification is aimed at changing the taken-for-granted (mis)perceptions of customers that African textiles are the option for the poor, old and uneducated. This surprising classification effort led the government to introduce what has become known as ‘Traditional Dress Day’, where Ghanaians wear African textile clothes rather than shirts and ties to work on Fridays, which constitutes a ‘shifting incarnation of tradition’ (Rovine, 2015). Almost all our respondents specifically singled out this initiative as a game-changing signature policy:

In my honest view, I think the recent trend is as a result of the awareness of promoting our culture. People nowadays are identifying themselves with who they are and where they come from. This is really shaping the way African garments were once viewed as an archaic element but now a cherished possession that every individual wished to be affiliated with. (Jones)

In a sort of culture war, politically engaged consumers and the progressive middle classes are increasingly pushing law-makers to ditch their Western suits for African garments. The slogan ‘back to roots’ has been the hallmark of these campaigns and, our data suggest, has

helped to transform a ‘buy made in Ghana’ sentiment into a contagious mainstream belief, which challenges long established mind-sets and identities (Anthony and Tripsas, 2016).

African garment has gained public spectacle because of its design and attractiveness. It is beauty from afar and near. Psychologically the colours are accommodating and emotionally it makes one feel good and raises one's social status and level of importance as one wears it. (George, designer)

Such cultural beliefs, constituted within these meaning-makings and inferences, have in turn led to the emergence of new meanings arising from transubstantiation of the value of African garments. We argue that such new meanings have gained traction and are gradually becoming institutionalized as a ‘new’ social paradigm of real time cultural transformation, within which African garments are produced and consumed.

4. Discussion and conclusion

We began our research by seeking to extend our understanding of how functional sources of innovation and technologies emerge through knowledge re-configuration to drive industrial regeneration. Empirically, we focused on Ghana's G&T industry to provide insight into the rise, decline and regeneration of one of Africa's premier industries. In tracing the short history of the industry's rise, fall and second rise, we identified key activities and events characterizing its evolution (Langley, 2007) over time, which suggest that the Ghanaian garment industry is in the grip of two mutually reinforcing sources of innovation which are illuminating and accentuating its resurgence. The first is second-hand clothing and China-made technologies, which both, for decades, spearheaded the destruction of the African G&T industry but have now turned out to be central to the industry's revival. The second is creative forecasting, new print and social media and the pan-African arts and cultural renaissance, ushered in by the recent adoption of new and retro-technologies (Sarpong *et al.*, 2019) in consumption. A summary of the sources of innovation and technologies driving the regeneration of the G&T industry in Ghana is presented in Table 1. Together, these latter four sources of innovation coalesce and reinforce, spurring the many industry actors to have faith in their industry's revival, and to repurpose widely available and ‘ready-to-hand’ technologies and meaning-making through frames. However, we surmise that while the observed regeneration is a step forward, it is not a ‘get-out-of-jail-free card’ for an industry which underwent so steep a fall in recent years. Thus, we dispel the idea of the Ghanaian G&T industry growing to become a major player in the world garment industry. Nevertheless, in catalysing the industry's enduring, gradual and systematic growth, these technologies and innovations provide a comfort blanket for the people whose livelihoods have come to depend on the industry.

Our findings also suggest that where once the industry largely concentrated on the production of commodity textiles for garment production, it has gradually progressed to focusing on other important value-added activities. In the absence of deliberate ‘smart-specialisation’, the emergence of this strategic move represents the outcome of interactions between industry actors' coping mechanisms that become established practices, government policy (in)action and socio-cultural legacies of the industrial decline. Specifically, the Ghanaian G&T industry has, over the years, gradually moved up the value chain, eschewing

production in favour of value-added activities such as design, marketing and sales. Specialization along the industry value chain means that the industry’s language has also changed. It used to be about, for example, re-tooling, pushing against imports and saving jobs. Our respondents now talk about latest designs, new digital media exports, cultural identity, renaissance and art. The organizing practices of the industry’s main actors have changed accordingly, as the design-to-value processes we identify point to a co-ordinated application of technology, social and business innovation in order to develop transformative solutions when battling the complex challenge faced by the garment industry. Our design-to-value processes, with their corresponding sources of innovation and practice, highlight the synergies that can be realized through such alignments.

Emphasizing the significant role of changing practices in extending our understanding of how innovation drives the regeneration of the G&T industry, we employ the circuit of practice (Shove *et al.*, 2012) to ‘visualize the performative interconnections between materiality, meanings and embodied ways of doing’ (Magaudda, 2011, p. 29), facilitating the transformation of the G&T industry. Our dynamic process model, as shown in Figure 4, summarizes the succession of unique events and performative practices which characterize the ongoing transformation and, in turn, add form and meaning to the epiphenomenon (Langley *et al.*, 2013) of regeneration of Ghana’s G&T industry. The solid lines represent the performative interconnections between materiality, meanings and doings, while the dotted lines demonstrate the actual relationships and influences which these elements establish within the industry (Sarpong *et al.*, 2017).

Our circuit starts from the instructive removal of the trade barriers which, for decades, shielded and protected the G&T industry from foreign competition (step 1). The market liberalization led to the demise of many firms and forced many industry actors to mobilize—‘We must do something about it’—exploring and exploiting potential opportunities and

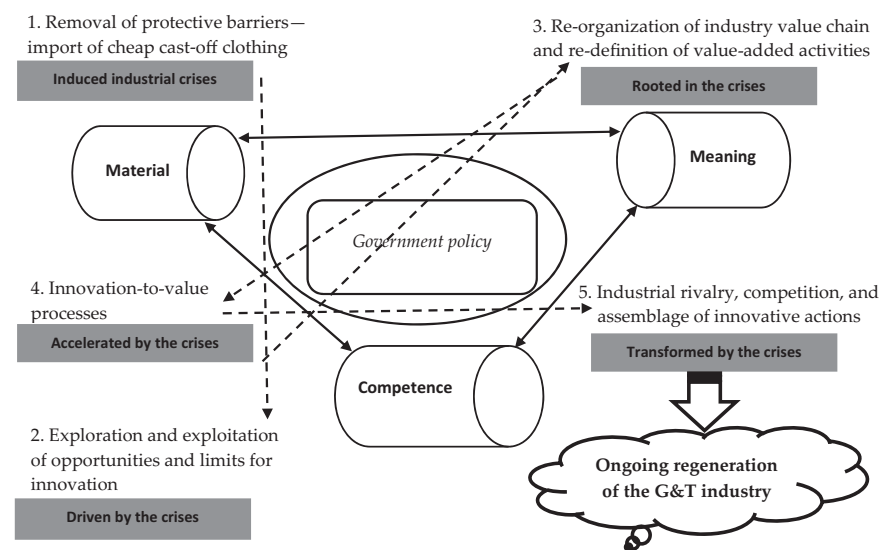


Figure 4. Visualizing the performative practice of innovation in Ghana’s G&T industry.

limits for innovation (step 2). These efforts led to the strategic redefinition and re-organization of the industry value chains and emphasis on value-added activities such as design, merchandising and marketing (step 3) and, more evidently, they contributed to the adoption and diffusion of innovation-to-value processes in organizing (step 4). This process led to sustainable value creation and capture, which, in turn, ushered in a new era of industrial rivalry, competition and institutionalization of good practices (step 5). This has finally translated into serious regeneration of the once moribund G&T industry (step 6). Note that government policy, at the centre of our circuit of practice, deals with meanings drawn upon by the various industry actors to manage the 'crucial issues of power, time and context' (Pye, 2002, p. 2), which, we argue, had an adverse influence on extending the collective thoughts, actions and doings of industry actors. Therefore, we argue that the government's liberalization programme, which had led to the removal of the industry's trade barriers in the first place, was apt. Nevertheless, the government did not leave the industry to its own devices, but employed various policy strategies to help and support the industry. In this regard, the removal of the trade barriers was not wrong: they had done their job and prevented the total collapse of the industry.

Our article and the empirical study it explores make two principal contributions. First, while prior research has shown that innovation in fibres and advances in textile manufacturing technology can precipitate the regeneration of a moribund textile industry (Crewe, 1996; Rantisi, 2002), our study provides insight into how microlevel processes are transmitted through social practices rather than through schemes or instructions to influence industry actors' predispositions to identifying opportunities for innovation. In this regard, our circuit of practice not only shows how innovation happens; it also emphasizes 'how the dynamism of practices emerges from the changing interrelations between elements and connections, [and] finds its empirical correlate in short illustrative change histories' (Hyysalo, 2016, p. 41) of organizing the G&T industry. Second, while global competitive forces may be shown to have contributed to the shift of resources and capabilities from one value-adding activity to another within the G&T value chain in Ghana, our study suggests that the re-emergence of the Ghanaian G&T industry is an ongoing process, and that what matters most in the regeneration of a once moribund industry is not innovation in cutting-edge technologies, but pervasive general purpose technologies which firms and industrial actors use in order to improve their situated practice and to generate and sustain their economic activities (Sepulveda, 2008). Third, we go beyond the well-trodden ground of delineating how specific low-tech innovations are produced, to provide insight into the kinds of innovation that emerging economies are likely to spawn and how such potential 'reverse innovations' may come to be identified and labelled in organizing (Agnihotri, 2015). Our study reveals that sustained innovation in emerging economies, particularly in the G&T industry, may depend more on access to diverse applied-recombinant knowledge, which enables relevant industry actors to fill technological gaps and take advantage of international standards and technologies.

Our study and its findings also open whole new vistas for the formulation of policies for the ongoing regeneration of the African G&T industry and the potential revitalization of moribund industries in the developing world. First, moving beyond prior policies often framed in terms of halting industrial declinism in the G&T industry (Amankwah-Amoah, 2015; Pickles and Smith, 2011), we invite policymakers to refocus their attention on grasping how 'innovation happens' in locations historically perceived to be devoid of innovation,

and on the spectre of reversing industrial decline. In highlighting the salience of domains of embeddedness and the context within which these innovations are produced, we argue that policymakers can better understand the mechanisms through which innovations come to be identified and labelled, and in turn can identify possibilities for facilitating their evolutionary trajectory toward industrial regeneration. Second, we observed that the regeneration of the G&T industry in Ghana has not been matched by expected improvements in productivity, which points to the need for policy initiatives to improve the ability of entrepreneurs and local firms to generate new absorptive capacities which would improve their operations. This, we surmise, is because many of the jobs generated in the industry are created by 'one-man' enterprises, who are often inefficient and have few resources to scale up (Dana, 2007). In this regard, access to improvement or start-up loans cannot be overemphasized. Such loans can also enable entrepreneurs and firms to invest in machinery in order to exploit scale and scope through co-operative and competitive interactions, which would help them to compete in export markets. Third, we propose a clarion call to policymakers, scholars and interest groups alike, to shift their focus from autopsies on the African G&T industry to plans for its regeneration. We argue that this shift could help to unlock the industry's latent potential, catalysing the African spirit of innovation and promoting home-grown, low-tech innovations to support the industry. These innovations could spread to other industries and in turn catalyse a generation of innovative products and services to tackle local and global challenges.

Our study is not without limitations, which in turn offer fruitful avenues for future research. First, while the empirical context of the G&T industry in Ghana and the data which we employed for our study are suitable for our research question, any extension of our research findings to other contexts, even to other African countries, should be done with a degree of caution. This is because the Ghanaian G&T industry has developed and continues to operate in a cultural, competitive and technological context which has forced industry actors to adopt an entrepreneurial posture. In this regard, replicating our study in a different setting could provide additional insights and a more robust appraisal of the technologies we identified in our study, in order to better qualify and empirically test the innovation dynamics we presented. Another promising direction for future work, providing deeper insight into the specific mechanisms through which industrial regeneration unfolds, would be comparative research into the regeneration of other moribund industries which for a long time were nurtured behind trade barriers. Future work may go further to delineate a detailed analysis of the processes through which actors in such industries may transition from a value-added activity like manufacturing to other value-adding activities such as design and marketing. Also, most of our discussion in this article has focused on how those working in the Ghanaian G&T industry see their problems, and the important growth in the sector, which has depended very much on the domestic market rather than being able to enter the export market. We concede that the picture is incomplete, with some interesting parts of the landscape remaining outside our focus of attention. In this regard, we encourage future research to go further to place this discussion more accurately into the context of how far the industry has grown, and possibly explore why it is still unable to compete internationally. Thus, the question remains, as it has since the 1970s, why Ghana cannot replicate the success of other countries in Asia, and indeed in other parts of sub-Saharan Africa, in creating a rapidly growing export market. Such approach, we surmise, could jumpstart new conversations and present a much broader picture of the success of the sector. Finally, while our study suggests

Table 1. Sources of innovation and technologies regenerating the G&T industry in Ghana

	Innovation-to-value processes	Source of innovation and technologies	Assemblage of innovative practices and activities
1.	Reverse design and the reinvention of local forms	Second-hand clothing	Second-hand clothing teardown, high-street clothing shop trawls,
2.	Appropriate technologies	China-made technologies—Apparel capital equipment and accessories, eco-friendly dyes, zips, synthetic fibres, sewing machines	Machines and apparel equipment sales, services and repairs, competitive retail of sewing and garment-making accessories
3.	Creative forecasting and social technologies of the web	Social media apps—Twitter, Instagram, WhatsApp and Facebook, garment, and fashion salons, print media	Digital sharing of garment patterns, digital commercials, fashion magazines and almanacs, retail catalogues and curated catwalk shows
4.	Transubstantiation-of-value	Pan-African arts and artefacts	Garment fit, cultural events linked to African arts and cultural heritage, African dress week, African fabric as a work of art

a rapid regeneration of the Ghanaian G&T industry, the productivity implications of the new technologies and innovations driving this renaissance are not visible. Echoing the aphorism used by Solow (1987) to describe computers as ‘everywhere but the productivity statistics’, we could not directly attribute the G&T industry’s productivity gains to the innovation and technologies we found. In this regard, we encourage multi-method research to explore the interactive effects of the innovations we identified on the productivity of the G&T industry. Such studies may go on to identify other pertinent drivers of productivity in the industry, or even uncover the potential impact of the industry’s innovation-produced changes on its productivity and future performance.

In conclusion, the regeneration of the Ghanaian G&T industry not only confirms how Africans are exploiting modern technologies and their ready-to-hand resources to unlock their potential and catalyse the African innovation spirit, but also tells a cautionary tale—pointing to the steep decline of important industries, which used to be protected and shielded from competition. However, it does point to an industrial story of promise: innovations produced in historically unexpected locations, for unexpected reasons, could potentially support and catalyse the regeneration of moribund industries. Perhaps it could indicate the starting point for regenerating the many tremendously declining industries in the developing world.

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